Can regulation improve the performance of government-controlled water utilities?

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Abstract

This paper provides evidence on whether regulation can improve the performance of government-controlled water utilities. While other studies have examined whether private participation combined with regulation can improve the performance of government-controlled water utilities, there has been little research on whether regulation alone can improve performance.

This paper examines five case studies on water utility reform in Latin America and the Caribbean. In each case study, a regulatory regime designed for private companies was applied to a government-controlled utility. Assessing performance across a number of indicators, the evidence shows that performance was as likely to deteriorate as to improve during periods of regulation of government-controlled utilities. This contrasts with the evidence of improvement following reforms that combined regulation with private participation. The findings suggest that conventional regulation may be of little use in government-controlled utilities. Conventional regulation is designed to prevent a profit-maximizing utility from raising tariffs above reasonable cost-recovery levels. Government controlled utilities, however, are not commercially motivated and face systematic incentives for short-termism in tariff-setting. Therefore, limiting monopoly profits is not usually the problem that needs to be addressed.

We conclude that conventional regulation of a government-controlled utility is not useful in isolation. However, regulatory tools can complement governance reforms. One approach may be to adapt conventional regulatory tools so as to help citizens judge utilities’ performance. Such an approach would help increase government accountability for the performance of government-controlled utilities.

Keywords: Governance; Government-control; Regulation; Water utilities

1. Introduction

There is growing interest in whether conventional economic regulation can improve the performance of government-controlled water utilities. Since the bulk of city-dwellers in the world rely on government-controlled utilities for their water supply, their performance is a vital policy issue.

doi: 10.2166/wp.2010.112

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This issue is acute because government-controlled water utilities typically perform poorly. While some do well—those in Singapore, New Zealand, the Netherlands, and Australia are notable examples—most offer only inadequate coverage, intermittent supply, and non-potable water. For example Araral (2008) found that, in India, water provided by government-controlled utilities is available on average for only 5 hours a day in 21 major cities.

For government-controlled utilities, networks, commercial operations and staffing are generally inefficient, wasting natural and financial resources. For example, a study of 50 government-controlled water utilities in 19 countries in Asia by McIntosh & Cesar (1997) found that the average non-revenue water (a widely-used measure of efficiency, which measures wasted water due to leaks, theft, unbilled consumption, and inaccurate metering), stood at 60%. According to a more recent survey by the Asian Development Bank (2007), average non-revenue water for 40 government-controlled water utilities in Southeast Asia stood at 28%. At the same time, tariffs seldom cover the full cost of service, meaning that water utilities are a burden on government finances and the taxpayer. According to estimates by the World Bank (Komives et al., 2006), only 30% of utilities globally, and only 50% of utilities in developed countries, generate sufficient revenue to cover operation, maintenance, and partial capital costs.

The combination of vital importance and chronic problems has created intense interest in ways to improve the performance of government-controlled utilities in developing countries. Bringing in private capital or managers to government-controlled utilities, in a variety of private-participation models, has been a prominent reform option. Private water utilities have existed in the USA, France, the UK, and elsewhere for over one hundred years. Private participation, as a way to turnaround under-performing government utilities, started being promoted in the late 1980s, with Chile, Guinea, and England and Wales among the pioneers. Since 1991, the World Bank has supported the implementation of over 660 private participation projects in water and sanitation.

While controversial, there is now good evidence that private participation is indeed effective at improving poorly-performing government-owned utilities. A World Bank paper by Gassner et al. (2007) conducted an empirical assessment of private sector participation (PSP) in water distribution in developing countries. The econometric study analyzed a panel of 141 water utilities with PSP and 836 state-owned enterprises (SOEs) in 71 developing and transitioning countries. The dataset covered over two decades (ranging from 1973–2005). The results of the study compared PSP and SOEs on a number of performance indicators. The study found that none of the indicators examined deteriorated under PSP, and that privately operated utilities outperformed SOEs in labor productivity and operational efficiency. In particular, the study found that the average number of residential water connections increased by 12%, residential coverage in sanitation services rose by 19%, and hours of daily water service increased by 41%. These effects—differences in averages between the pre-PSP and the post-PSP period—occurred over five years or more, and are over and above the change for similar SOEs.

Almost all reforms involving private participation in water distribution have also involved the introduction of some form of regulation. Given the controversy and difficulty of introducing private participation in water, this has naturally raised the question of whether regulation alone, without private participation, could improve the performance of under-performing government-controlled utilities.

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1 Data for 132 cities were assessed.


3 The global sample included developing regions as defined by the World Bank, which are East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia and Sub-Saharan Africa.
A number of jurisdictions have moved to regulate their government-controlled providers using regulatory models patterned after those used for private utilities. Examples include the States of Victoria and New South Wales in Australia, the island of Jamaica, and Scotland in the UK. Still, most jurisdictions continue to rely simply on public sector ownership and governance of the utility—examples include New Zealand, Barbados, Indonesia, and Uganda. As yet, there is little evidence as to whether regulation of the sort typically applied to private firms actually helps improve the performance of government-owned utilities.

To shed light on the question of whether regulation alone can improve performance, we have developed five case studies of water utility reform in Latin America and the Caribbean. The case studies all share the following characteristics:

- a regulatory regime was developed in anticipation of private participation in the utility;
- the utility then reverted to government control (four cases), or the envisaged private participation transaction was never completed (one case);
- the regulatory regime developed for the private participation transaction was then applied to the government-controlled utility.

What makes this set of cases particularly interesting is that the regulatory regime, in all cases, was a fully-fledged, conventional system, in the sense that it was developed in the anticipation that it would apply to a privately managed company. Most other cases of regulation of government-controlled utilities involve regulatory regimes developed in the expectation that they would apply to government-owned utilities. Arguably, in such cases, the regulatory designers may have taken less care than they would in a truly private transaction, or adapted the approach to take account of the fact that the utility was government-controlled. These cases, therefore, provide a distinctive opportunity to test the proposition that a regulatory regime of the sort commonly recommended for a privately managed utility can be used to improve the performance of a government-controlled company.

In the following section (Section 2), we present the five case studies, analyze their results, and summarize our findings. Evidence from these cases shows that regulation has done little to boost performance of these government-controlled utilities.

In Section 3, we suggest that integrating regulatory tools into an overall governance reform approach is likely to be more effective than simply applying regulatory systems designed for private utilities to government-owned utilities.

2. The case studies

The five case studies presented in this section are:

- Belize Water Services Ltd (BWS) in Belize;
- Agua y Saneamientos Argentinos (AYSA) in Buenos Aires, Argentina;
- Guyana Water Incorporated (GWI) in Guyana;
- Empresa de Servicios Sanitarios de Paraguay (ESSAP) in Paraguay;
- The Water and Sewerage Authority (WASA) in Trinidad and Tobago.
For each case we describe the institutional reforms implemented and the resulting application of regulation to a government-controlled utility. We then examine the change in performance of the utility under the combination of government ownership and conventional regulation. Following our presentation of the five cases, we conclude with our analysis and findings resulting from the case studies.

To assess the change in performance, we look at four indicators that are commonly used to judge the efficiency and financial health of water utilities:

- network efficiency, as measured by the percentage of non-revenue water (NRW), that is, water which leaks away, is stolen, or is otherwise consumed without being paid for;
- labor efficiency, as measured by number of staff per 1,000 active customers;
- operating cost recovery, as measured by operating revenues as a percentage of operating costs;
- average tariff level, which is calculated by dividing the revenue from water sales by the volume of water sold.

We focus on these indicators not just because they are some of the common measures of performance, but because they are the kind of things that one would expect a good quality regulatory system to be able to affect. OFWAT in the UK and the Regulatory Office in Manila, for example, have set NRW reduction targets for the private utilities in their jurisdictions, and have been successful in driving improvements on these measures. Labor productivity has also increased in most privately managed, regulated utilities.

Setting tariffs so that a utility can cover its reasonable costs is generally considered the most basic regulatory objective. The combination of the cost recovery indicator and changes in the average tariff allow us to see if the regulatory regimes in the countries considered are achieving this objective. Ideally, the analysis would also include data on changes in service levels. Unfortunately, data on service levels was not available on a reliable and consistent basis for the cases studied.

2.1. Belize Water Services Ltd (BWS) in Belize

In 2001, the Government of Belize created Belize Water Services Ltd. (BWS), vested it with the assets and liabilities of the previous government-owned utility, granted it a 25-year license, and sold 83% of the shares in BWS to the private water operator Cascal B.V. (Cascal). Four years later, the Government repurchased Cascal’s shares in BWS. As a result, the Government owns 83% of BWS’s shares (with the Social Security Board owning 10% and the general public having purchased the remaining 7%) and has the right to appoint seven of the eight members of BWS’ Board of Directors.

2.1.1. Changes in ownership have limited the regulatory framework. The Public Utilities Commission (PUC), was established in 1999, is responsible for regulating BWS. As part of the regulatory framework, the PUC should approve BWS’ tariffs on a five-yearly basis. BWS’ tariffs should be set at a level that ensures a 12% rate of return. BWS can apply to the PUC to increase its tariffs in line with inflation and other indexation factors annually. The PUC last completed a full tariff review for BWS in 2004, when the company was in private control.

Since the Government resumed control of the company in October 2005, BWS has not applied for an annual tariff increase in line with indexation factors—the last increase was in May 2005. BWS has not applied for a tariff increase because its Board, with Government as the majority shareholder, has
instructed BWS not to do so. Consequently, the PUC estimates that tariffs are 10 to 12% lower than they should be (given allowable increases for inflation and pass-through costs).

2.1.2. Tariff level does not permit BWS to undertake necessary capital expenditures. Table 1 shows that between 2002 and 2005, when Cascal was in control of BWS, the company made rapid gains in key efficiency indicators such as NRW and labor productivity. Thereafter, when BWS returned to Government ownership and control, the efficiency increases essentially stopped. The increase in operating efficiency, combined with tariff increases in 2004 and 2005, substantially improved the utility’s operating cost recovery ratio. However, the cash flow generated from operations has not been sufficient for the company to repay its existing debt. Nor can the utility make the substantial investments required to meet the coverage and quality of service goals expected of it, especially for wastewater treatment.

In summary, the water sector in Belize has a well developed regulatory framework that the Government, as the majority owner of BWS, has decided to circumvent. As a result, the lack of financial capacity to invest may jeopardize BWS’s substantial gains in operating efficiency and its ability to meet coverage and quality of service goals.

2.2. Agua y Saneamientos Argentinos (AYSA) in Buenos Aires, Argentina

In March 2006, thirteen years after it had awarded a thirty-year concession contract for providing water and wastewater services to the metropolitan area of Buenos Aires to a private company, the Government of Argentina terminated the concession contract and created Agua y Saneamientos Argentinos (AYSA), under private company law, to provide the services that had been concessioned. The Government capitalized AYSA with an initial equity contribution of 150 million pesos (equivalent to about 50 million US dollars). In exchange for this equity contribution, the Government owns 130,000 of the company’s 150,000 shares. All of these shares are denominated as Class A shares and represent 90% of the company’s social equity. AYSA’s Board of Directors consists of five members, four of whom are designated by the Government as the Class A shareholder and one by the Class B shareholders.

2.2.1. The government adapts prior regulatory framework for AYSA. Shortly after terminating the concession contract, the Government established a new regulatory framework that was largely based on

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Table 1. Operating and financial indicators for BWS (2002–2007).

<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Priv</td>
<td>Priv</td>
<td>Priv</td>
<td>Priv/Govt</td>
<td>Govt</td>
<td>Govt</td>
</tr>
<tr>
<td>Non-revenue water</td>
<td>52%</td>
<td>54%</td>
<td>43%</td>
<td>39%</td>
<td>40%</td>
<td>38%</td>
</tr>
<tr>
<td>Employees per 1,000 connections</td>
<td>6.7</td>
<td>6.1</td>
<td>5.8</td>
<td>5.3</td>
<td>5.4</td>
<td>5.3</td>
</tr>
<tr>
<td>Operating cost recovery ratio</td>
<td>126%</td>
<td>141%</td>
<td>146%</td>
<td>154%</td>
<td>162%</td>
<td>162%</td>
</tr>
<tr>
<td>Average tariff (BS$/1000 US gallons)*</td>
<td>12.1</td>
<td>13.5</td>
<td>14.</td>
<td>14.2</td>
<td>14.2</td>
<td>14.2</td>
</tr>
</tbody>
</table>

*This is the average effective rate for consuming 3,000 US gallons per month (264.2 US gallons = 1 m³).

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4 The other 20,000 shares, denominated as Class B shares, and representing 10% of the company’s social capital, are owned by the ex-employees of Obras Sanitarias de la Nación that had purchased shares in Aguas Argentinas.
the one in place during the concession with the private company. The underlying principle was that AYSA would operate through a concession contract that would be applied by an independent regulator (or in the case of the new framework, three separate bodies with responsibilities for regulating and planning).

The three main components of this revised regulatory framework are:

- a concession contract, expiring at end-2020, between AYSA and the Ministry of Federal Planning, Public Investment, and Services (MFPPIS);
- the designation of a dependency of the MFPPIS as the entity with primary regulatory authority over the concession;
- a regulatory entity (ERAS—Entidad Reguladora de Agua y Saneamiento) and a planning agency (APLA—Agencia de Planificacion), both created out of the previous regulatory agency (ETOSS—Ente Tripartito de Obras y Servicios Sanitarios). ERAS and APLA are effectively advisory bodies to the MFPPIS.

Despite the apparently comprehensive nature of this regulatory framework, it is unclear what portion of its cost of service AYSA is supposed to recover through its tariffs, or how the Government intends to ensure the financial sustainability of AYSA. In fact, the company’s tariffs have not increased since January 2002, despite large increases in costs.

### 2.2.2. AYSA’s efficiency is deteriorating

AYSA’s relatively good operating efficiency has decreased since it was created in 2006, as shown in Table 2. In 2007, it reported a NRW level of about 36%, labor productivity of about 1.5 employees per thousand customers, and a collection rate of about 95%. However, between 2006 and 2008 its operating costs nearly doubled. This doubling of its operating costs, in combination with tariffs that have not been increased since, has led to a drop in operating cost recovery levels from about 105% in 2006 to about 70% in 2008.

Despite AYSA’s poor financial situation, it is embarking on an ambitious capital expenditure plan to increase water coverage from about 80 to 100%, and sewerage coverage from 60 to 85% by 2011. These investments are also expected to improve some deficiencies in the quality of service, such as low water pressure. This plan—estimated by the company at about 2,000 million US dollars over the period 2008 to 2011—is based on the expectation that the Government will provide subsidies to cover the required capital expenditures.

In summary, despite an apparently comprehensive regulatory framework that includes three separate entities with some responsibilities for planning and regulating AYSA, the company is not financially sustainable because its tariffs are too low. Therefore, AYSA depends on subsidies from the Government to cover its operating and maintenance costs as well as any capital expenditures.

### Table 2. Operating and financial indicators for AYSA (2006–2008).

<table>
<thead>
<tr>
<th>Year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Priv/Govt</td>
<td>Govt</td>
<td>Govt</td>
</tr>
<tr>
<td>Non-revenue water</td>
<td>36%</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>Employees per 1,000 connections</td>
<td>1.50</td>
<td>1.50</td>
<td>1.55</td>
</tr>
<tr>
<td>Operating cost recovery ratio</td>
<td>104%</td>
<td>96%</td>
<td>70%</td>
</tr>
</tbody>
</table>
2.3. Guyana Water Incorporated (GWI) in Guyana

In the early 2000s, the Government of Guyana embarked on an ambitious program to improve the country’s water systems. The government-owned utility supplying the capital, Georgetown, was merged with the government-owned utility supplying the rest of the country. The merged utility was established under general company law as Guyana Water Incorporated (GWI), with 100% of its shares owned by the Government.

An international tender was held to select a specialist water operator to manage GWI. In November 2002, the UK company Severn Trent Water International (STWI) was awarded a five-year performance-based management contract.

Since GWI was to be privately managed, the Government decided it should be regulated in the way private utilities are generally regulated. Guyana already had a PUC, which had been created as the independent regulator of the telecommunications and electricity sector in 1990, and now operates under the 1999 Public Utilities Commission Act (Act 10, 1999). The PUC’s remit was extended to the water sector in 2003. It was given responsibility for regulating tariffs, service quality and expansion, and handling customer complaints. GWI was issued a license giving it the right to operate, and specifying the service standards it must achieve.

Under STWI management, GWI made some gains. Hours of service started to improve. The utility filed a rate application with the PUC and a 10% increase—less than that sought—was approved in 2005.

Unfortunately, the gains made were well below the levels envisaged in the management contract. As a result, the Government terminated the management contract in February 2007.

After the contract was terminated, the Government appointed a new Chief Executive to run GWI. The regulatory regime, and GWI’s corporate form, remained unchanged from what had prevailed under the management contract.

In the two years since it became a government-controlled, conventionally-regulated utility, there is no evidence that GWI has been able to improve on any of the key indicators. NRW figures are unreliable, as neither bulk supply nor consumption are properly metered, but observers believe that the utility has not managed to make any significant improvements. Labor productivity has declined (see Table 3).

Financial information is unreliable as GWI’s accounts continue to be prepared late, and are heavily qualified by the company’s auditor. However, indications are that operating cost recovery has not improved. Tariffs remain well below costs. Moreover, GWI continues to breach the service standards specified in its license.


<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
</tr>
<tr>
<td>Management</td>
<td>Govt</td>
<td>Priv</td>
<td>Priv</td>
<td>Priv</td>
<td>Priv</td>
<td>Mixed</td>
<td>Govt</td>
</tr>
<tr>
<td>Non-revenue water*</td>
<td>61%</td>
<td>66%</td>
<td>66%</td>
<td>72%</td>
<td>65%</td>
<td>65%</td>
<td>65%</td>
</tr>
<tr>
<td>Employees per 1,000 active customers</td>
<td>3.8</td>
<td>3.08 †</td>
<td>3.08 †</td>
<td>4.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating cost recovery ratio‡</td>
<td>66%</td>
<td>57%</td>
<td>68%</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>Average tariff (G$/m³)</td>
<td>35</td>
<td>38</td>
<td>38</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† August 2007 Management report.
‡ GWI calculations from the 2007 10-yr turnaround.
Notes: Some figures estimated from discussions with management and donors, due to lateness and unreliability of GWI accounts.
In summary, after the utility reverted to government control, performance gains slowed or went into reverse. The regulator did not act to enforce service standards, and the utility did not apply for further tariff increases, even though these were manifestly required.

2.4. Empresa de Servicios Sanitarios de Paraguay (ESSAP) in Paraguay

In 2000, the Government initiated a program to reform the water sector in Paraguay. The reform included a law that allowed for the privatization of the government-owned water utility (ESSAP—Empresa de Servicios Sanitarios de Paraguay), and a law that established a new legal framework for the sector and created a regulatory authority (ERSSAN—Ente Regulador de Servicios Sanitarios). However, in 2002 the Congress approved Law 1932, which prohibited the privatization of ESSAP. As a result, the Government continues to own 100% of ESSAP’s shares. Therefore, the regulatory framework established in anticipation of having a private company owning and controlling ESSAP is being applied to a government-controlled utility.

The new legal and regulatory framework created ERSSAN as the regulatory authority responsible for economic regulation of ESSAP and all other water and sewerage providers in Paraguay. However, the Government did not take the steps required to implement this regulatory framework as intended in the law. For example, the Government did not prepare the concession contract between itself and ESSAP that would have provided for ERSSAN’s regulation of ESSAP. Without this concession contract, ERSSAN’s role was largely eliminated and the Government, as the company’s owner, effectively retained control over setting the company’s tariffs. Tariffs were therefore not increased at a time when the company would have required significant increases in internally generated cash to meet its existing financial obligations.

2.4.1. ESSAP’s financial obligations limit any possibility for the company to make required capital expenditures. In anticipation of the privatization of the company, the Government increased ESSAP’s tariffs in 2002. This increase in tariffs contributed to an improvement in the company’s operating cost recovery level from about 131% in 2002 to 174% in 2003. However, without any further tariff increase after 2002, the operating cost recovery level fell to 154% by 2005. This seemingly high operating cost recovery level, however, did not generate sufficient cash from operations. This happened because, at the time of ESSAP’s creation, the Government established a financial obligation to itself in the form of a canon payment that was equal to about 60% of the company’s operating revenues. As a result, the company was unable to plan and carry out the investments necessary to increase its efficiency, improve its poor service (frequent water shortages every summer), and increase its falling coverage levels (amongst the lowest in Latin America at about 80% in water and 40% in sewerage). In fact, between 2002 and 2005, the company invested less than US$5 million. In comparison, the estimated investment requirement for improving the company’s quality of service and meeting the Government’s coverage goals was approximately US$30 million over a three-year period (see Table 4).

ESSAP was created from the previous government-owned water utility (CORPOSANA—Corporación de Obras Sanitarias) and incorporated as a company under private law. The company is responsible for providing water and sewerage to all municipalities with a population greater than 10,000.
In summary, following the cancellation of the process to privatize ESSAP, the Government failed to implement the comprehensive legal and regulatory framework that had been developed for the water sector. As a result, ESSAP has not had the financial capacity to make the required investments to improve its poor service and increase its low coverage levels.

2.5. Water and Sewerage Authority (WASA) in Trinidad and Tobago

In 1994, the Trinidad and Tobago Government decided to delegate the management of WASA, the islands’ water statutory authority. The Government’s purpose was to improve service quality, with particular reference to reliability and upgrading of the utility’s infrastructure (Wagenheim, 1995). A five-year management contract was concluded with a subsidiary of Severn Trent, the UK water company.

This was intended to be the first step towards a longer term arrangement for private operation of the island’s water system. In preparation for this longer term PSP arrangement, the Government established the Regulated Industries Commission (RIC) by Act No. 26 of 1998. The RIC was given regulatory jurisdiction over the electricity and water sectors.

As it turned out, the Severn Trent team was not able to achieve the goals set in the management contract. When the contract ended in 1999, the Government decided to bring the utility back under government management, rather than proceed with the planned longer term private participation arrangement. However, even while bringing the utility back into government control, the Government persevered with the regulatory regime created in anticipation of continued private participation.

Bearing in mind that the Government decided not to continue with private participation in light of the disappointing state of the utility at the end of the management contract, improvements in WASA’s performance were clearly needed, and expected. However, in WASA’s eight years as a government-controlled utility, operating under a conventional regulatory regime, no such improvements are in evidence (see Table 5).

Unaccounted for water is estimated at 55%, and has been constant at that level since 2002. This is an estimate only, as the absence of bulk meters and customer meters means that actual consumption—and therefore losses—is not measured. Pilot loss reduction studies indicate that unaccounted for water is in fact higher than 60% in some regions.

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<table>
<thead>
<tr>
<th>Year</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
</tr>
<tr>
<td>Non-revenue water</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Employees per 1,000 connections</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td>Operating cost recovery ratio</td>
<td>130%</td>
<td>151%</td>
<td>131%</td>
<td>174%</td>
<td>166%</td>
<td>154%</td>
</tr>
<tr>
<td>Average residential tariffs (US dollar/m³)*</td>
<td>0.48</td>
<td>0.41</td>
<td>0.34</td>
<td>0.31</td>
<td>0.33</td>
<td>0.32</td>
</tr>
</tbody>
</table>

* This is the average tariff for a residential customer that consumes 15 m³ per month. In local currency terms (Paraguayan Guaraní—PGY) the rate was increased 17% from 1,681 PGY/m³ to 1,966 PGY/m³ in September 2002. The variations in US dollars are due to variations in the exchange rate between the US dollar and Paraguayan Guaraní. From 2000 to 2005 the Paraguayan Guaraní depreciated by about 76% against the US dollar.
High system losses have resulted in water scheduling, with some areas of the country receiving supply for less than 48 hours per week. To respond to these frequent supply interruptions, most consumers have installed water tanks, which are replenished each time supply is provided to an area.

Labor efficiency has deteriorated, with the utility now employing 16 staff for every 1,000 connections, where previously only 10 were needed. Revenues covered only 63% of operating costs at the start of the period, and this figure has deteriorated steadily to the point that revenues are now only 40% of operating costs. At the start of the period, WASA’s tariffs were low by regional standards, and had not been increased for eight years. Despite this, and despite WASA’s worsening financial position, tariffs have remained constant over the period.

In summary, for eight years the regulator has not been able to make WASA reduce costs, nor has it increased tariffs toward cost recovery levels. The regulator initiated a tariff review in December 2007. This has not resulted in any ruling to date. However, it is possible that the situation may change when the ruling is eventually issued.

2.6. Case studies analysis and findings

Table 6 summarizes changes in performance of the utilities while operating as conventionally-regulated government-owned companies, according to the four key indicators:

- **Network efficiency.** While BWS managed to continue the program of improvements started under private management, water losses remained high at AYSA, GWI, and ESSAP, and actually worsened noticeably at WASA;
- **Labor efficiency.** ESSAP managed to slightly improve labor productivity, BWS remained constant, while AYSA, GWI, and WASA all had declining labor productivity;
- **Operating cost recovery.** Reflecting their ability to control costs, ESSAP and BWS show some improvements in operating cost recovery, although not sufficient to cover the utilities’ financial obligations. AYSA started the period able to cover its operating costs, but by the end of the period tariffs were only sufficient to pay 70% of operating costs. WASA started the period with operating losses, and these losses grew steadily. GWI had the lowest level of cost recovery, and has not improved under government-control;
- **Average tariff level.** Since none of the utilities are able to cover their full costs, and three cannot even cover their operating costs, tariff increases might be thought in order. However, due to lack of autonomy or authority to request tariff increases, none of the utilities studied has increased tariffs during their period of government-control and conventional regulation.

Table 5. Operating and financial indicators for WASA. The tariff reported is the domestic tariff only. However, tariffs for other customer categories have also not changed.

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
</tr>
<tr>
<td>Management</td>
<td>Priv</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
<td>Govt</td>
</tr>
<tr>
<td>NRW</td>
<td>45%</td>
<td>45%</td>
<td>45%</td>
<td>55%</td>
<td>55%</td>
<td>55%</td>
<td>55%</td>
<td>55%</td>
<td>55%</td>
<td>55%</td>
</tr>
<tr>
<td>Employees per 1,000 active customers</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>15</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Operating cost recovery ratio</td>
<td>67%</td>
<td>63%</td>
<td>63%</td>
<td>59%</td>
<td>45%</td>
<td>45%</td>
<td>43%</td>
<td>42%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>Average domestic tariff (TT$/m³)</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
</tr>
</tbody>
</table>

The overall impression is of stagnation and regress. Across the five cases and four performance measures, half registered no change, four improved, and six got worse.

It should be borne in mind that none of the utilities were doing well at the start of the period considered. In four cases, the government had taken back control of the utility from a private firm because of perceived problems. In the case of ESSAP, the government had been planning a public–private partnership to address the utility’s performance problems, but Congress prevented it from implementing it. Clearly improvements were needed, and one might have assumed that a conventional regulatory system could have helped to deliver them. But this did not happen.

3. Regulatory tools to improve governance

The lack of improvements in the case studies may seem surprising. Why did regulation alone not deliver the desired result of improving utility performance? Why the marked contrast to the experience of regulation combined with private participation?

With regard to the first question, we believe the regulatory frameworks in place did not contribute to improving the performance of these utilities once government ownership resumed because of the persistent inability of government-owned utilities to obtain tariffs that recover costs. The constant theme emerging from the case studies is that the government utilities did not have the autonomy or authority to request tariff increases. Without any requests for tariff increases, regardless of how necessary they were, the regulatory framework was impotent. Therefore, we believe that the performance of the utilities considered would not have deteriorated even further without regulation.

With regard to the second question, the findings can be explained by the fact that conventional regulatory systems are designed to apply to profit-seeking firms. Conventional regulation works by channeling private, profit-seeking incentives toward publicly beneficial ends. By limiting tariffs to reasonable cost levels, and only adjusting them with a lag, regulation gives private firms an incentive to increase efficiency, because the resulting cost savings translate into higher profits. Regulators can also rely on profit-seeking firms to ask for tariffs that are above cost-recovery levels. Consequently, the focus of conventional regulation is on limiting tariffs to no more than reasonable cost recovery levels.

Conversely, most government-controlled firms do not seek profits. Managers in the utilities in our five case studies were not rewarded for making profits, nor punished for making losses. On the contrary, they may have been incentivized by the political system to increase certain types of costs, for example, to employ more staff. Similarly, the government-controlled utilities surveyed did not seek tariff increases.

Table 6. Overall summary of changes in performance. For each indicator, the table shows how many of the five utilities got better, how many stayed the same, and how many got worse, over their period of operation as a conventionally-regulated government utility. The bottom line in the table sums the total number across all the indicators.

<table>
<thead>
<tr>
<th>Performance</th>
<th>Better</th>
<th>Same</th>
<th>Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network efficiency (Non-revenue water %)</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Labor efficiency (employees per 1,000 active customers)</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Operating cost recovery (%)</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Average tariff</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Total (indicators)</td>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>
The dominant incentive was the political one of keeping tariffs low. As a result, in none of the cases did the utility file for a tariff increase, and in three of the five cases cost recovery fell.

Clearly, conventional regulatory designs cannot be relied on to improve the performance of government-controlled companies. But this does not mean that the tools of regulation are of no value in such cases. Rather, it means that those tools must be used in new ways—ways that take into account the real incentive structure of the utilities to which they are applied.

In the remaining part of this section, we:

- analyze key governance problems that lead to utility under-performance (3.1);
- analyze how regulatory tools may be used to improve governance (3.2).

3.1. Governance problems and utility under-performance

The continued underperformance of the utilities in the case studies can be explained by their dysfunctional incentive structures, which in turn are a product of their poor governance arrangements. Better governance, then, is the key to better performance.

Public utilities can perform well if the accountability systems and incentives that drive them are well designed. Figure 1 from the World Bank (2008) provides a generic framework for sector governance that can be used both to diagnose the short-comings of actual governance frameworks, and to design ways to improve them.

The basic logic is that water providers have monopoly power, and so product market competition is not enough to make them accountable to customers. Instead, a ‘long route’ of accountability is needed. In this ‘long route’, the public looks to the government to ensure that good water services are provided at reasonable cost. The government, in turn, ensures that the water provider meets public expectations. In principle, this system should be able to deliver good services, and indeed it does in countries such as New Zealand and the Netherlands.

All too often, though, the accountability links shown in Figure 1 do not work properly. Three common problems are short-termism, interest group politics, and corruption.

Fig. 1. Governance framework. Dashed lines indicate a ‘long route’ of accountability needed when providers are not directly accountable to the public/customers. The short route of accountability refers to a situation where customers are able to directly seek redress from providers. (Source: World Bank, 2008).
3.1.1. Short-termism. Politicians focus on giving the public what they want before the next election, not over the medium term. Since water networks are long-lived and respond only slowly to changes in how they are managed, short-termism can be disastrous. For example, most customers would prefer to pay a bit more and get a decent service. But because tariff increases are felt now, while the improvements they fund typically take a minimum of three years to be felt, the common political incentive is to keep tariffs low and allow the water assets to slowly deteriorate. In all the cases analyzed, NRW (a measure of asset quality) was poor, and only in one case was there any improvement over the period. In all cases, tariffs stagnated at below full cost recovery levels.

3.1.2. Interest group politics. Improving the performance of water utilities is generally cost-benefit justified, but not Pareto efficient. In other words, unlike in a Pareto efficient outcome where all will be winners, reforms of water utilities generate losses for some. The potential losers include consumers with illegal connections who are made to pay for water, and workers who are surplus to requirements and let go.

The poor state of many government-controlled water utilities can be explained by the political incentive to use the utility to court the support of particular groups. Networks are expanded into marginal electorates to win votes, regardless of whether the investment is economically justified. Public utility employment decisions may be driven by providing patronage to supporters. Indeed, in three out of the five cases studies, the number of staff employed per thousand active connections increased during the period of combined government-control and conventional regulation.

3.1.3. Corruption. Public utilities control substantial resources. Those who control the utility may seek to transfer these resources from public purposes to personal and party-political ends. Staff responsible for metering, billing, and collections may facilitate illegal connections in exchange for bribes from the consumers—bribes that are often shared up the management chain, so creating a systemic incentive to preserve illegal consumption.

Similarly, procurement of capital works, equipment, and supplies is another common way for public resources to be transferred to private and political ends. The winners of these contracts are required to pay the staff responsible for them, or to make campaign contributions to the political party in power, in order to secure the contracts (Halpern et al., 2008).

Indeed, Estache & Kouassi (2002) estimated that if corruption could be eliminated in water utilities, cost reductions in the order of 64% could be achieved. However, corruption benefits a small group of relatively powerful people. The costs of corruption are dispersed widely and born largely by less powerful people. As a result, the governance structure of many utilities supports corrupt activities, rather than trying to root them out.

3.2. Using regulatory tools to improve governance

Of course, it is not new to observe that regulation and governance must work hand-in-hand. It is sometimes asserted that the best way to achieve this is to make government-owned utilities mimic private utilities. In this section we first explore this approach, observing that while it can work in certain situations, the case studies show that its application may be much more limited than has often been assumed (3.2.1). We then describe ways in which regulatory-like tools can be used to create more effective, but distinctly public sector governance arrangements (3.2.2).
3.2.1. Regulation combined with mimicking private-sector governance has limited application. Many countries have adopted ‘corporatization’ as a kind of ‘privatization-lite’—an attempt to get the observed benefits of private management of commercial organizations, while avoiding some of the political costs of actual privatization. The New Zealand government pioneered this approach in the second half of the 1980s. It worked relatively well in New Zealand, was taken up by a number of state governments in Australia, and in time also began to be recommended in developing countries.

While there are many forms of corporatization, in essence the idea is to make a government-controlled firm behave like a private firm. This includes giving it a separate legal identity, the right to spend the revenues it generates, an accrual accounting system, and a board of directors. It also includes giving the firm commercial objectives. For example, New Zealand’s corporatization statute mandates that state-owned enterprises should make profits comparable to private firms.

Where the commercial mandate is effective—in the sense that board and management of a utility genuinely place profitability above political objectives—conventional regulation should help improve performance. Managers will seek to boost profits, and so will try to keep tariffs above cost-recovery levels, while limiting their costs. They will also try to provide good service in order to avoid financial penalties for breaching regulatory standards. The State of New South Wales in Australia is among the jurisdictions which have taken this approach the furthest. The Independent Pricing and Regulatory Tribunal (IPART) regulates Sydney Water and a number of other corporatized water utilities in the State, and is generally thought to make a significant contribution to improving their performance.

The achilles heel of the corporatization model is that it depends on government-owned utilities being able to ‘role-play’ that they are private, and government ministers being able to role-play that they are shareholders. In New Zealand and Australia, this role-playing has worked. But it only seems to work in societies in which there is a solid understanding of how company governance works, and a general belief that government should be an enabler, not a manager. Even in New Zealand, the initial zeal for profit-seeking, and arms-length relation between state-owned enterprises and governments, has decayed considerably in the two decades since the model was introduced.

The five case studies nicely illustrate the limits to applying the ‘corporatization plus regulation’ model in other social and political contexts. In all five cases, the utility was a separate corporate entity. In four of the five cases it was incorporated under private company law. Yet in none of the five cases did the utility exhibit clear commercial incentives.

The reality is that, in the case study countries, the role-playing that the ‘corporatization plus regulation’ model requires is an alien concept. In Guyana, Belize and Trinidad, for example, applying for a tariff increase is a decision made by a political directorate, not the management or board of the utility. Other board functions, such as appointing the Chief Executive and approving the capital expenditure plan, are also in fact made by Cabinet.

Where the governance structure does not give utilities commercial objectives, a regulatory regime designed for profit-seeking firms is unlikely to be a good fit. What could work better?

3.2.2. Regulatory tools to strengthen democratic accountability. As we have seen, the governance structures of government-controlled utilities are generally quite different from those of privately-managed utilities, and have distinctive weaknesses. When citizens demand good services from the governments that control their utilities, but cannot get the governments or utilities to deliver, something is wrong with the long-route of accountability. Either citizens cannot make governments do what they want, or governments cannot make government-controlled utilities deliver. Fundamentally, the flaws in
the accountability system are what allow the problems of short-termism, interest group politics, and corruption to persist.

Common flaws in the accountability system include information asymmetries, lack of capacity, and difficulties in making credible commitments. After analyzing these flaws, we suggest a few ways in which regulatory tools may be used to help overcome them.

**Information asymmetries and lack of transparency.** Citizens and the decision-makers they elect may not know what level of service is possible, and so have no benchmark against which to assess the level of service they are getting. In particular, they lack reliable information on what level of service should be reasonably possible at a given cost, and so cannot make cost-benefit trade-offs. They remain hostage to utility managers who assert that the service being provided is the best that can be achieved with the resources available.

Citizens and their elected politicians may also not know the actual levels of service being provided. Basic information like hours of supply and the percentage of the population served is lacking in many systems.

Finally, the quantity of government support to the water utility is usually hidden. The losses the utility makes are concealed in deteriorating assets and accumulating debt burdens. Government support, rather than being transparent, may be spread across multiple capital programs and irregular bail-outs when the debt burden becomes unsustainable. In Guyana, for example, GWI is unable to pay its electricity bill, so it accumulates arrears to the state-owned power company, which the Government periodically clears. When no one has a clear view of the quantity of public resources the water utility is consuming, citizens, politicians, and officials simply cannot judge whether the resources are being well deployed.

Not knowing the resources being deployed, or the results that should be attainable with those resources, or even the results actually attained, citizens are unable to hold their governments accountable, and governments are unable to hold their utilities accountable.

**Difficulties in making credible commitments.** Even if citizens had a clear understanding of the current situation, and of what is possible, that might not be enough. Politicians might promise to take a long-sighted view, but still cave in to short-term incentives to keep tariffs down as an election approaches. Utility managers might sign up to reduce corruption but still seek to profit from kickbacks on construction contracts when they return to their offices. In other words, existing governance systems for government-owned utilities make time-consistent commitment difficult. People make commitments, but will soon find it is in their interest to renege.

**How regulatory tools can help.** To overcome information asymmetries and transparency problems, three regulatory tools may be useful.

- **Benchmarking.** Regulators like OFWAT (in England and Wales) benchmark water utilities against each other to establish reasonable cost levels as an input to setting price caps. For a government-controlled utility, an agency that could provide benchmarking information understandable by citizens and their elected officials might help with accountability by giving people a better idea of what is possible in the way of service and efficiency, and how well their own utility is doing. A number of countries, including the Philippines and Indonesia are trying this out. The World Bank’s International Benchmarking Network for Water and Sanitation (IBNET) provides a global compilation of performance indicators. As yet, however, these efforts suffer from problems regarding the reliability of the data, and the limited attention paid to making sure it is accessed and understood by citizens and elected officials;
- **Reliable third-party analysis of achievable quality and cost combination.** Most regulatory processes involve analysis of utility business plans to ensure services are provided at a quality and cost that citizens want, and to optimize the trade-off between cost and quality. In the case of private utilities, the resulting service levels and tariff limits are then imposed on the company. In the case of government-controlled utilities, the real value of such an exercise may be in helping citizens and elected decision-makers to understand what is reasonably possible. For example, in a situation in which the government effectively controls tariff levels, what is needed may be not so much an agency to limit tariff increases, but one which publicizes the likely medium term consequences—in the form of deteriorating assets and service—of failing to increase tariffs;

- **Performance contracts.** Accountability becomes easier when there is an agreement on what should be achieved, and reliable monitoring of whether it has been achieved. Relatively simple performance contracts, in which utility managers commit to government and the public to reach certain targets provided they are allowed to charge certain tariffs and receive other agreed support, could help in these cases. While somewhat similar to the concession contracts used as the basis for regulation in Argentina and some other countries, the performance contract would differ in one crucial regard. It would not be legally enforceable between arms length parties, but rather a basis on which citizens could judge whether their government is delivering (and vote accordingly), and governments could judge whether the utility management team is performing, and reward or replace them accordingly. One example is Société Nationale d’Exploitation et de Distribution des Eaux (SONEDE), a statutory water body in Tunisia which has operated under such contracts since 1992. Another is the National Water Sewerage Company, which is a statutory body in Uganda that has also signed multi-year performance contracts (Baietti *et al.*, 2006).

Overcoming the problem of credible commitments within a government-controlled system is more difficult than providing information. In some cases, a government may overcome short-termism in tariff decisions for government-controlled utilities by delegating tariff-setting to an independent body. The Office of Utilities Regulation in Jamaica, for example, established its credibility as a telecommunications regulator, and was then able order water tariff increases that were grudgingly accepted by the public. The Independent Pricing and Regulatory Tribunal (IPART) in New South Wales has been able to do the same. The Regulated Industries Commission in Trinidad has initiated a tariff review of WASA, so it will soon be known if it is able to achieve the tariff increase needed.

The limits to this approach also need to be considered. As a simple matter of mechanics, the regulatory regime needs to allow the regulatory authority to initiate tariff reviews on its own motion. Most conventional regulatory regimes—like those in Guyana and Belize—assume that the utility will apply for tariff increases. In these cases, government-controlled utilities have simply not applied for increases to which they were entitled. More fundamentally, where a regulatory body lacks popular legitimacy, governments will likely ignore or overturn their rulings to increase tariffs.

Finally, even if an independent regulatory body is successful in increasing tariffs, it may not do so well in making the utility reduce its costs. In Jamaica, for example, the National Water Commission continues to be inefficient even as it is awarded ever higher tariffs. The Office of Utilities Regulation, like other regulators of government-controlled utilities, can do very little. Since the Office does not manage the company, it cannot intervene directly, for example to lay-off surplus staff, change procurement practices, or introduce a NRW education campaign. At the same time, the conventional regulatory tool of fining a utility for non-compliance, or limiting tariffs to a level that covers only reasonable costs, does not work since it is ultimately tax-payers who suffer the losses, not the utility’s managers.
4. Conclusion

In conclusion, our five case studies show that conventional regulation may be of little use in improving the performance of government-controlled water utilities. The problem is that conventional regulation does not address the governance problems that lie at the root of government-controlled utilities’ performance problems.

Most obviously, the decision to apply for a tariff increase for a government-controlled utility typically lies with the government. Governments face systematic incentives for short-termism in tariff-setting. For this reason, none of the five government-controlled utilities in the cases studied applied for a tariff increase, even though in all cases such an increase was needed.

More subtly, regulation cannot overcome the problems of corruption and interest group politics that drive up costs in government-controlled utilities. And because most government-controlled utilities are not commercially motivated, there is no inherent incentive on managers to reduce costs. Regulators may cap prices at no more than cost-recovery levels, or fine utilities for non-compliance, but the losses the utility makes in consequence will not make the utility’s managers worse off, but simply be passed on to tax-payers.

It follows that regulation cannot be applied to a government-controlled utility in isolation, but rather should be designed to support complementary governance reforms. A commonly advanced model has been to corporatize government-controlled utilities, give them commercial objectives, and then impose conventional regulation. This has worked to some extent in Australia, and in New Zealand’s electricity sector. However the evidence from the cases reviewed is that corporatization as a governance reform only works in a limited set of circumstances. In all five cases, the utility was a corporate entity with formal commercial objectives, but these legal forms did little to limit the substance of direct government control for political ends.

A promising approach may be to apply some of the tools used by conventional regulators directly to improve governance. Poor governance stems in large part from citizens and elected officials being unable to judge whether the services being provided by the utility are the best that can be achieved with the resources available. Tools that could help include benchmarking, independent expert analysis, and reporting against agreed performance contracts.

Delegating decisions on tariffs and other regulatory questions to an independent body could help in some cases to overcome short-termism in tariff setting. But for this to work, the independent body must be able to initiate the tariff review itself, and must command popular respect. Even in cases where an independent body can help to keep tariffs in line with costs, it may not be able to keep costs down to reasonable levels. Other governance reforms, such as performance pay for managers, may well be more powerful than regulation in improving the performance of government-controlled water utilities.

References


